

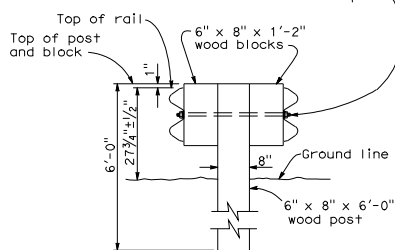
Technical drawing of a bridge railing cross-section. The drawing shows a railing profile with various components and dimensions. Key features include:

- Bridge Rail, See Note 6.**: The top horizontal rail.
- 25'-0" Transition Railing (Type WB), See Note 5**: A section of the railing with a transition.
- 25'-0" Parabola**: A parabolic section of the railing.
- Begin Parabola**: The start of the parabolic section.
- Begin 15:1 or flatter flare**: The start of a flare section.
- ETW**: End of Traffic Way.
- Double MBGR**: Double Main Bridge Guard Rail.
- Caltrans approved Crash Cushion See Note 8**: A section of the railing designed for impact.
- 31'-3" for Type CAT**: A section of the railing with a specific length.
- Shoulder**: The area to the right of the railing.
- 12.5° Departure Angle**: The angle of the shoulder slope.
- 1:10 or flatter slope**: The slope of the shoulder.
- 1:6 Taper**: The taper of the shoulder.
- Hinge point**: The point where the railing meets the shoulder.
- Center of post**: The center of the railing post.
- 10'-0" 10'-0"**: Dimensions for the center of the post.
- 3'-0" Min**: Minimum dimension for the center of the post.
- Median**: The area between the bridge and the shoulder.
- Bridge Shoulder line**: The line defining the shoulder.
- Projected 12.5° departure angle**: The projected angle of the shoulder.
- Departure Angle**: The angle of the shoulder.
- 30° Min**: Minimum angle for the shoulder.
- Opening between adjacent or parallel bridge**: The gap between bridges.
- 0.8" offset**: Offset dimension.
- 3" offset**: Offset dimension.
- 6" offset**: Offset dimension.
- 1'-0" offset**: Offset dimension.
- Rail Tensioning Assembly, see Note 7**: A component for tensioning the railing.
- Length based on 12.5° departure angle but not less than 25'-0"**: A dimension for the flare section.

Additional text in the top right corner:

or completeness of electronic copies of this plan sheet.  
To get to the Caltrans web site, go to <https://www.caltrans.ca.gov>

5/8" Ø Button head bolt with hex nut or  
5/8" Ø Rod, threaded both ends, with  
hex nuts. 1/2" Max exposed threads  
after hex nut(s) tightened. No washer on  
rail faces for bolted connection to line post.



Base Line (Edge of paved shoulder or offset line of edge of traveled way)

Begin flare

$L$  Length of flare

$W$  Maximum offset

$X$  Distance along base line

$Y$  Offset from base line

$y = \frac{Wx^2}{L^2}$

Diagram of a simply supported beam of length  $L$  with a triangular load. The load intensity starts at 0 at the left support and increases linearly to  $W$  at the right support. The beam is divided into four equal segments of length  $L/4$ . The maximum deflection is shown as a dashed line, and the deflection at the center is labeled  $W/16$ . The deflection at the quarter points is labeled  $W/4$ .

### TYPICAL PARABOLIC LAYOUT

1. Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
2. Guard railing post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. Wx 2 size of post, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. Direction of adjacent traffic indicated by ➡.
5. For Transition Railing (Type WB) details, see Standard Plan A77J4.
6. For additional details of a typical connection to bridge rail, see Connection Detail AA on Standard Plan A77J1.
7. For Rail Tensioning Assembly details, see Standard Plan A77H2.
8. The type of Crash Cushion to be used will be shown on the Project Plans.
9. Type 12E Layout is typically used left of approaching traffic at the end of each structure on multilane freeways or expressways where a median type barrier is not constructed between separated roadbeds.
10. The 15:1 or flatter flare is measured off of the edge of traveled way.

### METAL BEAM GUARD RAILING TYPICAL LAYOUTS FOR STRUCTURE APPROACH

**A77F3**